MATHEMATICS CROSSWALK
2008 DRAFT MATHEMATICS STANDARD TO 2003 MATHEMATICS STANDARD
GRADE 8

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL				
Strand 1: Number and Operations				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Number Sense	1	Compare and order real numbers including very large and small integers and decimals and fractions close to zero.	1	Locate rational numbers on a number line.
	2	Classify real numbers as rational or irrational.	2	Identify irrational numbers.
			3	Classify real numbers as rational or irrational.
	3	Solve problems that involve absolute value. *		
2. Numerical Operations	1	Solve contextual problems including word problems with factors, multiples, divisibility (with or without remainders), prime numbers, and composite numbers.	1	Select the grade-level appropriate operation to solve word problems.
			2	Solve word problems using grade-level appropriate operations and numbers.
	2	Describe the effect of multiplying and dividing by numbers including the effect of multiplying and dividing a rational number by: • zero, • a number less than zero, • a number between zero and one, • one, or • a number greater than one. *		
	3	Recognize the application of the properties of the real number system: commutative, associative, distributive, identity, inverse, and closure.	6	Apply grade-level appropriate properties to assist in computation.
			8	Use grade-level appropriate mathematical terminology.

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Strand 1: Number and Operations				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
2. Numerical Operations	4	Simplify numerical expressions using the order of operations that include grouping symbols, square roots, cube roots, absolute values, and positive exponents.	3	Determine the square of an integer.
			4	Determine the square root of an integer.
			5	Identify squaring and finding square roots as inverse operations.
			7	Apply the symbols "√" to represent square root, "±" to represent roots, and "{}" as grouping symbols.
			11	Apply the symbols "√" to represent square root, "±" to represent roots, and "{}" as grouping symbols.
	5	Use ratio and proportionality to solve problems involving percentages (including percent increase, percent decrease, and simple interest rates).	9	Calculate the missing value in a percentage problem.
	6	Convert standard notation to scientific notation and vice versa (include positive and negative exponents).	10	Convert standard notation to scientific notation, and vice versa.
	7	Simplify expressions using the rules of exponents. *		
3. Estimation	1	Make estimates appropriate to a given situation by: • selecting the appropriate method of estimation, • analyzing the effect of an estimation method on the accuracy of results, and • evaluating and justifying the reasonableness of results in a variety of situations that may or may not include calculator and computer results.	1	Solve grade-level appropriate problems using estimation.
			2	Use estimation to verify the reasonableness of a calculation (e.g., Is 32 the square root of 64?).
			3	Express answers to the appropriate place or degree of precision (e.g., time, money).
			4	Verify the reasonableness of estimates made from calculator results within a contextual situation.

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Strand 1: Number and Operations				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
3. Estimation	2	Locate rational and common irrational numbers on a number line.	S1C1-01	Locate rational numbers on a number line.
			S1C1-02	Identify irrational numbers.
			S1C1-03	Classify real numbers as rational or irrational.

Strand 2: Data Analysis, Probability, and Discrete Mathematics				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Data Analysis (Statistics)	1	Solve problems by constructing, interpreting, and making calculations based on box and whisker plots, circle graphs, and scatter plots (e.g., for scatter plots determine positive and negative correlation and line of best fit).	2	Construct box-and-whisker plots.
			4	Interpret box-and-whisker plots, circle graphs, and scatter plots.
			9	Solve contextual problems using scatter plots, box-and-whiskers plots, and double line graphs of continuous data.
			11	Identify a line of best fit for a scatter plot.
	2	Answer questions by selecting, creating, and interpreting contextual displays of data.	3	Determine the appropriate type of graphical display for a given data set.
			5	Answer questions based on box-and-whisker plots, circle graphs, and scatter plots.
	3	Describe how measures of center and the range relate to the shape of the distribution; informally identify outliers and determine their effect on mean, median, mode, interquartile range (midspread) and range.	6	Solve problems in contextual situations using the mean, median, mode, and range of a given data set.

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Strand 2: Data Analysis, Probability, and Discrete Mathematics				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Data Analysis (Statistics)	4	Make inferences by comparing two or more data sets describing the same characteristic for two different populations or two subsets of the same population.	7	Formulate reasonable predictions based on a given set of data.
			8	Compare trends in data related to the same investigation.
	5	Determine whether information is represented effectively and appropriately given a graph or a set of data by identifying sources of bias and compare and contrast the effectiveness of different representations of data.	3	Determine the appropriate type of graphical display for a given data set.
			10	Evaluate the effects of missing or incorrect data on the results of an investigation (e.g., Susie's teacher recorded a 39 instead of a 93 for her last quiz, what will happen to Susie's average?).
	M05-S2C1-01	**Moved to Grade 5**	1	Formulate questions to collect data in contextual situations.
	MCWR-S2C1-08	**Moved to College and Work Readiness**	12	Distinguish between causation and correlation.
2. Probability	1	Determine the probability (theoretical or experimental) that a specific event will occur in a compound probability experiment.	1	Determine the probability that a specific event will occur in a 2-stage probability experiment.
			2	Solve contextual situations using probability (e.g., If the probability of Michelle making a free throw is 0.25, what is the probability that she will make three free throws in a row?).
			3	Predict the outcome of a grade-level appropriate probability experiment.
	2	Interpret probabilities within a given context and compare the outcome of an experiment to predictions made prior to performing the experiment.	4	Record the data from performing a grade-level appropriate probability experiment.
			5	Compare the outcome of an experiment to predictions made prior to performing the experiment.
			7	Compare the results of two repetitions of the same grade-level appropriate probability experiment.
	3	Use all possible outcomes (sample space) to determine the probability of dependent and independent events.	6	Distinguish between independent and dependent events.

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Strand 2: Data Analysis, Probability, and Discrete Mathematics				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
3. Discrete Mathematics – Systematic Listing and Counting	1	Solve counting problems and represent counting principles algebraically including factorial notation.	1	Determine all possible outcomes involving the combination of two or more sets of objects (e.g., If you roll a six-sided number cube 4 times, how many possible outcomes are possible?).
			2	Determine all possible arrangements given a set (e.g., How many ways can you arrange a set of 7 books on a shelf?).
	2	Represent, analyze, and solve counting problems that do or do not involve ordering and that do or do not involve repetitions.	1	Determine all possible outcomes involving the combination of two or more sets of objects (e.g., If you roll a six-sided number cube 4 times, how many possible outcomes are possible?).
			2	Determine all possible arrangements given a set (e.g., How many ways can you arrange a set of 7 books on a shelf?).
4. Discrete Mathematics – Vertex-Edge Graphs	1	Use vertex-edge graphs and algorithmic thinking to represent and find solutions to practical problems related to Euler/Hamilton paths and circuits.	1	Solve contextual problems represented by vertex-edge graphs.
	2	Use directed graphs to solve problems; construct an adjacency matrix for a given directed graph.	1	Solve contextual problems represented by vertex-edge graphs.

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Strand 3: Patterns, Algebra, and Functions				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Patterns	1	Describe and extend numerical and geometric patterns using tables, graphs, words, or symbols.	1	Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.
			2	Extend a grade-level appropriate iterative or recursive pattern.
			3	Solve grade-level appropriate iterative or recursive pattern problems.
2. Functions and Relationships	1	Write the rule of a simple function using formal algebraic notation.	1	Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).
	2	Translate between different representations of linear expressions using symbols, graphs, tables, or written descriptions.	3	Determine whether a graph or table is related to a given equation of the form $y=ax^2$ where 'a' is a natural number.
	3	Use a table of values to graph an equation; describe the graph's characteristics.	S4C3-01	Use a table of values to graph a linear equation.
	4	Describe a contextual situation that is depicted by a given graph; sketch a graph that models a given contextual situation.	4	Identify independent and dependent variables for a contextual situation.
	5	Determine if a relationship is a function given a graph.	*	
	6	Identify graphs as linear or nonlinear functions.	2	Distinguish between linear and nonlinear functions, given graphic examples.

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Strand 3: Patterns, Algebra, and Functions				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
3. Algebraic Representations	1	Write or identify algebraic expressions, equations, or inequalities that represent a situation.	2	Use variables in contextual situations.
			3	Translate a written sentence or phrase into an algebraic equation or expression, and vice versa (e.g., Three less than twice a number is 2*n*-3.).
			4	Translate a sentence written in context into an algebraic equation involving two operations.
			5	Translate a contextual situation into an algebraic inequality (e.g., Joe earns more than $5.00 an hour; therefore, $x > 5$).
			6	Identify an equation or inequality that represents a contextual situation.
	2	Evaluate algebraic expressions, including formulas, by substituting rational values for variables.	1	Evaluate algebraic expressions by substituting rational values for variables [e.g., 2(*ab*+*ac*+*bc*), when $a = 2$, $b = 3/5$, and $c = 4$].
	3	Simplify algebraic expressions using order of operations and combining like terms (apply the identity, inverse, and associative properties).	9	Solve two-step equations with rational coefficients and integer solutions (e.g., $3x + 5 = 11$, $4x – 20 = 8$).
	4	Solve linear equations or inequalities.	7	Solve one-step equations with rational numbers as coefficients or as solutions.
			8	Solve one-step equations that model contextual situations.
			9	Solve two-step equations with rational coefficients and integer solutions (e.g., $3x + 5 = 11$, $4x – 20 = 8$).
	5	Analyze situations or solve problems using linear equations and inequalities.	6	Identify an equation or inequality that represents a contextual situation.
	6	Graph an inequality on a number line.	10	Identify an equation or inequality that represents a contextual situation.
	M08-S4C4-03	**Moved to Strand 4 Concept 4**	11	Solve a simple algebraic proportion.
	M08-S4C3-02	**Moved to Strand 4 Concept 3**	12	Solve applied problems using the Pythagorean theorem.

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Strand 3: Patterns, Algebra, and Functions				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
4. Analysis of Change	1	Interpret relationships between symbolic linear expressions and graphs of lines by identifying and computing slope and intercepts.	1	Identify the slope of a line as the rate of change (the ratio of rise over run).
	2	Solve contextual problems using simple rates.	1	Identify the slope of a line as the rate of change (the ratio of rise over run).
			S5C1-01	Describe how to use a proportion to solve a problem in context.

Strand 4: Geometry and Measurement				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Geometric Properties	1	Identify the properties of circles: radius, diameter, chords, tangents, secants, inscribed angles, central angles, intercepted arcs, circumference, and area.	7	Recognize the relationship between inscribed angles and intercepted arcs.
			8	Identify tangents and secants of a circle.
	2	Predict results of combining, subdividing, and changing shapes of plane figures and solids (e.g., paper folding, tiling, and rearranging cut up pieces). *		

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Strand 4: Geometry and Measurement				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Geometric Properties	3	Use proportional reasoning to justify relationships of congruence and similarity.	1	Draw a model that demonstrates basic geometric relationships such as parallelism, perpendicularity, similarity/proportionality, and congruence.
			10	Identify corresponding angles of similar polygons as congruent and sides as proportional.
			S4C4-06	Solve problems using ratios and proportions, given the scale factor.
			S4C4-07	Calculate the length of a side, given two similar triangles.
			S5C1-01	Describe how to use a proportion to solve a problem in context.
	4	Determine the measure of angles created when parallel lines are cut by a transversal.	1	Draw a model that demonstrates basic geometric relationships such as parallelism, perpendicularity, similarity/proportionality, and congruence.
			6	Identify the properties of angles created by a transversal intersecting two parallel lines (e.g., corresponding angles are congruent).
	5	Use the Pythagorean Theorem to solve problems.	S5C2-04	Verify the Pythagorean theorem using an area dissection argument.
	M07-S4C1-02	**Moved to Grade 7**	2	Draw 3-dimensional figures by applying properties of each (e.g., parallelism, perpendicularity, congruency).
	M05-S4C4-06	**Moved to Grade 5**	3	Recognize the 3-dimensional figure represented by a net.
	M07-S4C4-06	**Moved to Grade 7**	4	Represent the surface area of rectangular prisms and cylinders as the area of their net.
	M05-S4C1-02	**Moved to Grade 5**	5	Draw regular polygons with appropriate labels.
	MHS-S4C1-07	**Moved to High School**	9	Determine whether three given lengths can form a triangle.

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STRAND 4: GEOMETRY AND MEASUREMENT				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
2. Transformation of Shapes	1	Identify lines of symmetry in plane figures or classify types of symmetries of plane figures. *		Identify the planar geometric figure that is the result of a given rigid transformation.
	2	Model the result of rotations in multiples of 45 degrees of a figure about the origin.	2	Model a simple transformation on a coordinate grid (e.g., Translate right four units and down two units.).
	3	Describe the transformations that created a tessellation.	1	Identify the planar geometric figure that is the result of a given rigid transformation.
3. Coordinate Geometry	1	Make and test a conjecture about how to find the midpoint between any two points on a coordinate plane.	2	Determine the midpoint given two points on a number line.
	2	Use the Pythagorean Theorem to find the distance between two points in a coordinate grid.	3	Determine the distance between two points on a number line.
			S3C3-12	Solve applied problems using the Pythagorean theorem.
	M08-S3C2-03	**Moved to Strand 3 Concept 2**	1	Use a table of values to graph a linear equation.
4. Measurement	1	Solve problems involving conversions within the same measurement system such as conversions involving square inches and square feet.*		
	2	Calculate the area and perimeter of composite figures.	1	Solve problems for the area of a trapezoid.
	3	Solve geometric problems using ratios and proportions.	6	Solve problems using ratios and proportions, given the scale factor.
			S3C3-11	Solve a simple algebraic proportion.
	4	Calculate the surface area and volume of rectangular prisms, cylinders, and composite solids.	2	Solve problems involving the volume of rectangular prisms and cylinders.
			3	Calculate the surface area of rectangular prisms or cylinders.
			4	Identify rectangular prisms and cylinders having the same volume.

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Strand 4: Geometry and Measurement				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
4. Measurement		**REMOVED**	5	Find the measure of a missing interior angle in a triangle or quadrilateral.
	M08-S4C1-03	**Moved to Strand 4 Concept 1**	7	Calculate the length of a side, given two similar triangles.

Strand 5: Structure and Logic				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
1. Algorithms and Algorithmic Thinking	1	Create an algorithm to solve problems involving indirect measurements: • proportional reasoning, • dimensional analysis, • density, and • rates. *		
	2	Describe when to use proportional reasoning to solve a problem.	1	Describe how to use a proportion to solve a problem in context.
			S4C4-06	Solve problems using ratios and proportions, given the scale factor.
	M06-S5C1-01	**Moved to Grade 6**	2	Analyze algorithms.
2. Logic, Reasoning, Arguments, and Mathematical Proof	1	Develop the problem-solving strategy of writing an equation.	S3C2-01	Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).
			S3C3-03	Translate a written sentence or phrase into an algebraic equation or expression, and vice versa (e.g., Three less than twice a number is 2*n*-3.).
			S3C3-04	Translate a sentence written in context into an algebraic equation involving two operations.
			S3C3-06	Identify an equation or inequality that represents a contextual situation.

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Strand 5: Structure and Logic				
CONCEPT	**2008 PO**	**ITEM DESCRIPTION**	**2003 PO**	**ITEM DESCRIPTION**
2. Logic, Reasoning, Arguments, and Mathematical Proof	2	Solve a non-routine problem by selecting and using a strategy.	S1C2-01	Select the grade-level appropriate operation to solve word problems.
			S1C2-02	Solve word problems using grade-level appropriate operations and numbers.
	3	Solve logic problems involving multiple variables, conditional statements, conjectures, and negation using words, charts, and pictures.	1	Solve a logic problem given the necessary information.
	4	Make, validate, and justify conclusions and generalizations about linear relationships.	S3C2-01	Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).
			S3C2-03	Determine whether a graph or table is related to a given equation of the form $y=ax^2$ where 'a' is a natural number.
			S3C2-04	Identify independent and dependent variables for a contextual situation.
	5	Identify simple valid arguments using *if…then* statements (e.g., All squares are rectangles. If quadrilateral ABCD is a rectangle, is it a square?).	2	Identify simple valid arguments using *if…then* statements (e.g., All squares are rectangles. If quadrilateral ABCD is a rectangle, is it a square?).
	6	Verify the Pythagorean Theorem using a valid argument.	4	Verify the Pythagorean theorem using an area dissection argument.
	7	Model the relationship between the subsets of the real number systems.	3	Model a contextual situation using a flow chart.
			S1C1-03	Classify real numbers as rational or irrational.

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